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COLLEGES AND UNIVERSITIES OFFERING COURSES IN WILDLIFE MANAGEMENT, 1937-38

Prepared in the Section of Wildlife Surveys
Division of Wildlife Research

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INTRODUCTION

Adjustments are taking place rapidly in college and university courses of study covering the field of training in wildlife management. In an effort to show these trends and to assist students seeking information regarding graduate and undergraduate training in wildlife management, material has been assembled from available catalogs, bulletins, and correspondence and is here presented without claiming that it is complete or attempting to set up standards or a qualitative analysis of courses. If an accredited college or university is not listed, it should not be construed that it was purposely omitted, but rather that there was unavailable definite information concerning the present status of the curricula. Corrections or additions are invited to make future revisions of the list authoritative and as helpful as possible to students desiring information from the Bureau of Biological Survey on wildlife-management courses.

All accredited educational institutions offer major courses in biology, or in its subdivisions, zoology and botany, as being required and elective courses leading to advanced work in medicine, agriculture, and forestry, and in the liberal arts and sciences. Many institutions offer specialized courses that may be regarded as fitting into a wildlife-management curriculum. Helpful and often basic as such courses are, however, few institutions are as yet offering a full four-year course leading to a degree in wildlife management. Ordinarily little attempt is made in the basic biology courses to point out or interpret for the student practical applications in wildlife conservation and management. Recent trends show recognition by some educational institutions of the wildlife professional field as in the professions of law, medicine, forestry, business administration, banking, and engineering.

In graduate work there is opportunity for specialization in the broad fiel of wildlife management, including game and fur-animal production, control of wildlife diseases, and fish culture; extension work in wildlife management; and educational work in the relationships of wildlife to agriculture, to forestry, and to other land uses. In the field of research, workers are needed who are trained in the distribution and taxonomy of birds, mammals, and other vertebrates, and in aquatic biology, ecology, food habits, fur-animal production, and the control of wildlife diseases and parasites.

PREPARING FOR RESEARCH

In the Federal and State services and in the educational and research work of colleges and universities there is a limited demand for highly trained personn not necessarily graduates of schools offering wildlife-management courses, but me whose studies have been followed by several years' apprenticeship under experienc supervisors.

In the field of mammal and bird taxonomy, well-grounded schooling is essential in general biology, zoology, physiology and anatomy, histology, genetics, aquatic and marine biology, and museum technique. Food-habits research requires training in a varied field, to identify in animal stomachs the fragments of plant seeds, mammals, birds, fishes, reptiles, amphibians, insects, and aquatic life, i all stages of maturity; it includes also experience in the field and knowledge an skill in laboratory technique. The physiology, nutrition, and hormone fields are open for advanced research on the health and vitality of important wildlife group

Research in the life history and habits of bird and mammal species calls f persons familiar with a wide range of animal and plant identifications; having a knowledge of forestry, agricultural crops, and soils, of breeding, feeding, and nesting habits, and of predation, diseases and parasites; and acquainted with physical factors and the daily and seasonal movements peculiar to the various species of birds and mammals. The investigator must be able to recognize and interpret facts in their proper setting and perspective.

To evolve practical methods for the prevention, arresting, and cure of animal maladies on game and fur farms and under natural field conditions, laboratory and field workers in the realm of wildlife diseases and parasites must have a thorough knowledge of laboratory technique; thorough training in diagnosis; and be familiar with the identification of endemic diseases, ecto- and endo-parasites, tumors, and morbid tissues.

Fur and game farms and wildlife experiment stations require personnel trained in wildlife production. This includes a knowledge of the principles of breeding, feeding, and management as well as of diseases and their control. Although the basic principles involved in the production of fur and game mammals and game birds are fundamentally the same as those applied to the production of domestic livestock and poultry, special knowledge is required to apply these principles in this relatively new field of wild-animal production.

Control-methods research involves familiarity with the life histories and habits of wildlife species that reach destructive abundance and a knowledge of biochemistry and laboratory technique, field methods designed to reduce populations economically, and the use of deterrents and preventives.

PREPARING FOR ADMINISTRATION

In the field of game management, the protection of favored species demands men familiar with wildlife, its habits, habitats, and ranges, and trained in the technique of law enforcement, men who have a working knowledge of Federal and Stat protective laws and regulations and know how to develop and manage wildlife refug Personnel for the control of species harmful to agricultural crops, livestock, forestry, and grazing, and destructive to desirable forms of wildlife, must be familiar with the habits of all the major species in the area involved, have a perspective of those that are injurious in the general wildlife picture, a knowledge of control technique, with experience in field application and ability to recogni wildlife values from esthetic and recreational points of view.

Field workers dealing with wildlife in relation to forestry, soil conservation, flood control, reclamation, drainage, grazing control, in fact, all phases in the forest-wildlife, farm-wildlife, and aquatic-wildlife relationships, from an administrative standpoint, should have training in the basic science courses, a technical knowledge to interpret and apply known and recorded facts, a good background of animal and plant ecology, some training in business administration and economics, an understanding of silvicultural methods, forest administration, agriculture, animal husbandry, and soils, and some engineering training involving dam construction, drainage, and navigation. The land administrator must be able to fit wildlife into the multiple land-use picture.

Migratory-bird refuge administration requires personnel familiar with life histories and habits of waterfowl, fur animals, and upland birds; with aquatic vegetation suitable for food, cover, and nesting sites, and technique in improving food and cover; and with desirable water levels and their engineering phases. Refuge managers must be informed on protective laws and regulations, and trained in business administration and in handling personnel and equipment.

Wildlife management, in its broad sense, is of interest to many American groups: (1) Those interested from the esthetic sense, deriving pleasure from observing the many forms in their natural habitat; (2) those that enjoy the pursuit of game species for sport and recreation; (3) those that profit financially from the sale of hunting rights, sporting goods, cameras, and binoculars; (4) trappers and those engaged in fur production, manufacture, and trade; and (5) the many enterprises incidentally connected with recreation and enjoyment. The prospectiv student must judge wherein his or her interest lies in such a varied combination of human relationships to the wildlife resources of the country.

Students preparing to teach wildlife management in colleges and universiti or through the extension services of the various States, need the basic training heretofore mentioned in connection with wildlife administration. In carrying proved management methods to the rural people through the extension services, it is desirable that the specialist have an appreciation of agricultural science and economics, an understanding of extension teaching methods, and several years' practical experience with wildlife, in actual field research or in management work

UNDERGRADUATE TRAINING

Many institutions offer premedical courses and courses in biology, zoology, botany, and general science that are essentially basic to the training of students who wish to enter the wildlife field. In the lists that follow, however, consideration has been given only to those schools that offer a full curriculum of specific courses in wildlife conservation and management. For full particulars as to the content of courses, prospective students should correspond directly with the schools. Much depends upon the auspices under which the major course is given, as for example, whether in forestry or in agriculture.

The following list of important American educational institutions, compiled as mentioned in the introductory paragraphs, is segregated into groups that offer (1) a full wildlife curriculum leading to a degree; (2) a partial wildlife course in connection with forestry; (3) a partial course in connection with agriculture; and (4) elective wildlife courses in connection with general zoology or biology:

1. Wildlife Management and Conservation (Four-year Course)

Connecticut State College.--Department of Forestry and Wildlife Management--Major leads to B. S. degree in Wildlife Management.

Iowa State College.--Department of Horticulture and Forestry--B. S. degree in Forestry and Wildlife Management (five-year course).

Maine, University of.--Department of Forestry--B. S. degree in Wildlife Conservation.

Michigan State College.--Division of Applied Science--B. S. degree in Wild Animal Conservation or Wild Animal Production.

Minnesota, University of.--School of Agriculture--B. S. degree in Wildlife Management. (See School of Forestry, under (2) below.)

New York, Cornell University.--College of Agriculture--B. S. degree in Wildlife Conservation and Management. Recognized divisions are (1) Ornithology, (2) Game-bird Propagation, (3) Game Management, (4) Economic Zoology and Animal Ecology, and (5) Fisheries.

Oregon State College.--School of Agriculture: Fish and Game Management Course, Curricula in Animal Industries--B. S. degree in Agriculture, electives in Diseases of Game Birds and Animals, Division of Veterinary Medicine.

Texas Agricultural and Mechanical College.--Department of Wild Game-- B. S. degree in Wildlife Management.

Utah State College.--School of Forestry and Range--B. S. degree in Forestry. (Complete Range and Wildlife Management Course.)

Washington State College.--Department of Zoology: Conservation of Wildlife and Game Management--B. S. degree in Zoology.

2. Partial Course in Schools, Departments, or Divisions of Forestry

California, University of.--Electives in Economic Zoology in the Department of Zoology.

Colorado State College.--Senior Electives in Department of Entomology-Zoology.

Idaho, University of.--Electives in Department of Zoology.

Indiana, Purdue University.--Electives in Department of Forestry.

Louisiana State University.--Electives in Game Management, Department of Forestry.

Massachusetts State College.--Junior and senior electives in Division of Horticulture and Forestry. (See School of Agriculture, under (3) below.)

Michigan, University of.--Junior and senior electives in Wildlife Management, School of Forestry and Conservation--B. S. degree in Forestry.

Minnesota, University of.--Junior and senior electives in Game Management, School of Forestry--B. S. degree in Forestry.

Montana, University of.--School of Forestry and Division of Biological Sciences, major in Wildlife Management--B. S. degree in Forestry.(See Department of Zoology under (4) below.)

New Hampshire, University of.--Electives for juniors in School of Forestry.

New York, Syracuse University.--Forest Zoology electives in the College of Forestry--B. S. degree in Forestry.

North Carolina State College.--Game Management electives in the Division of Forestry--B. S. degree in Forestry.

3. Partial Course in Colleges or Schools of Agriculture

(Some schools listed under Department or Division of Forestry might also be placed in this list.)

Alabama Polytechnic Institute.--Electives in Department of Zoology-Entomology.

California, University of.--College of Agriculture: Electives in Department of Zoology.

Massachusetts State College.--Two-year Vocational Wildlife Management Course: Stockbridge School of Agriculture.

Nebraska, University of.--Electives in College of Agriculture.

Ohio State University.--Elective Wildlife Conservation Courses in Department of Zoology and Entomology--B. S. degree in Agriculture.

Pennsylvania State College.--Electives in Department of Zoology.

Virginia Polytechnic Institute.--Electives in Conservation and Forestry, Department of Biology--B. S. degree in Agriculture.

4. Elective Courses in Departments of Zoology or Biology

Arizona, University of.--Electives in Department of Zoology.

Illinois, University of.--Electives in Department of Zoology.

Missouri, University of.--Electives in Department of Zoology available to undergraduates in College of Arts and Science and College of Agriculture.

Montana State College.--Electives in Department of Zoology--B. S. degree in Division of Science, with options in Wildlife Conservation.

Montana, University of.--Major in Forestry Course, minor in Wildlife Technology; also Wildlife Technology--leading to A. B. degree.

Wyoming, University of.--Electives in the Division of Letters and Sciences.

GRADUATE TRAINING

Institutions in the graduate field offer advanced students (1) material organized from original sources; (2) seminars for a critical study of wildlife; and (3) research problems seeking original data under the direction of experienced instructors.

Cooperative Wildlife-Research Units

Through funds furnished from Federal appropriations, and cooperative funds provided by the American Wildlife Institute, State conservation departments, and land-grant colleges, the Biological Survey in 1935-36 established nine cooperative wildlife research units regionally throughout the United States. One object of these units is to provide specialized training in wildlife research and management through graduate fellowships, leading to advanced degrees. Graduate students are selected on the basis of high qualifications. These units have been established at the following institutions:

Alabama Polytechnic Institute.--M. S. degree in Agriculture, Department of Zoology-Entomology. Wildlife research problems and course work. Original thesis required for graduation.

Connecticut State College.--M. S. degree in Wildlife Management, Department of Forestry and Wildlife Management. Course work and original thesis required.

Iowa State College.--M. S. and Ph. D. degrees in Economic Zoology, Department of Zoology and Entomology. Course work and research problems in wildlife management, leading to an original thesis, required.

Maine, University of.--M. S. degree in Wildlife Conservation, Department of Forestry. Advanced course work and original thesis required.

Ohio State University.--M. S. and Ph. D. degrees in Zoology, Department of Zoology and Entomology. Course work and original thesis selected in Wildlife Conservation required. Graduate work in Wildlife Diseases--prerequisite a degree in Veterinary Medicine.

Oregon State College.--M. S. and Ph. D. degrees in Agriculture, Division of Animal Industries: Fish and Game Management. Course work and original thesis required for graduation.

Texas Agricultural and Mechanical College.--M. S. degree in Wildlife Management, Department of Wild Game. Course work and original thesis on some wildlife research problem required.

Utah State Agricultural College.--M. S. degree in Wildlife Management, also in Range Management, School of Forestry. Course work and individual research in some wildlife problem, with completed thesis, required.

Virginia Polytechnic Institute.--M. S. degree in Wildlife Conservation, Department of Biology. Graduate Wildlife Conservation, certain course work, and completed thesis required for graduation.

Other Institutions

In addition to the nine foregoing institutions, graduate work in wildlife management is offered at the following colleges and universities:

Massachusetts, Harvard University, The Harvard Forest.--M. F. and Ph. D. degrees in Forestry, Division of Biology, emphasis on wildlife management. Research problems in forest wildlife management, with original thesis, required for graduation.

Michigan, University of.--M. F. and Ph. D. degrees in Forestry, School of Forestry and Conservation, and M. S. degree in Graduate School specializing in Wildlife Management and Administration. Original thesis required for graduation.

Minnesota, University of.--M. S. degree in Economic Zoology, Department of Entomology and Zoology. Research in Economic Vertebrate Zoology, with completed original thesis, required.

Missouri, University of.--A. M. degree in Zoology, Department of Zoology, specializing in Wildlife Management. Course work and half the credit hours must be spent in research on some problem leading to a thesis.

New York, Cornell University.--M. S. and Ph. D. degrees in Graduate School. Research problems in Wildlife, Game Management, and Propagation, with completed thesis, required for graduation.

Wisconsin, University of.--M. S. and Ph. D. degrees in Wildlife Management, under auspices of the Chair of Game Management, Department of Agricultural Economics. Course work: Research work on wildlife problems and professional training in game management.

WILDLIFE-MANAGEMENT COURSES

Course titles have been taken from catalogs, so that prospective students may note the possible field of training in colleges and universities. Students should examine the opportunities offered and determine whether courses are available to fit their particular interest at institutions of their choice. The following courses are given at one or more colleges:

- Agriculture, General
- Agricultural Economics
- Agricultural Engineering
- Agronomy
- Anatomy, General
  - Comparative
- Animal Behavior
- Animal Husbandry
- Animal Nutrition

- Bacteriology
- Big-game Mammals
- Biology, General
- Botany, Advanced
  - Aquatic
  - Forest
  - Systematic
  - Taxonomic

- Chemistry, General
  - Agricultural
  - Biochemistry
  - Qualitative
  - Quantitative
- Cytology

- Dendrology
- Drafting

- Ecology, Elementary
  - Animal
  - Forest
  - Plant
- Embryology
- English - Thesis
- Entomology, General
  - Aquatic

- Forage Plants
- Forest Administration
- Forest Mapping
- Forest Mensuration
- Forest Planting
- Forest Protection
- Forestry, General

- Game Management
- Genetics
- Geology

- Herpetology
- Histology

- Ichthyology
- Incubating and Brooding

- Landscape Horticulture
- Languages
- Limnology

- Mammalogy
- Museum Management

- Ornithology

- Parasitology
- Physics
- Physiology, General
  - Plant
- Public Speaking

- Range Management

- Silviculture
- Small-game Mammals
- Social Sciences
- Soils
- Surveying

- Wildlife Conservation
- Wildlife Diseases
- Wildlife Food Crops
- Wildlife Management
- Wildlife Protection

- Zoology, General
  - Advanced
  - Economic
  - Forest
  - Invertebrate
  - Vertebrate